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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,258	08/27/2003	Han-Ping Pu	6319-66761	7182
24197	7590	11/16/2004	EXAMINER	
KLARQUIST SPARKMAN, LLP 121 SW SALMON STREET SUITE 1600 PORTLAND, OR 97204			NGUYEN, DILINH P	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/650,258

Applicant(s)

PU, HAN-PING

Examiner

DiLinh Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 12-14 and 18-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Jiang et al. (U.S. Pat. 6,610,591).

Jiang et al. (fig. 1, column 6, lines 40 et seq.) disclose an electronic package comprising:

a device carrier 10 including a metal surface;
at least a semiconductor unit 20 including at least an electrode 46;
at least an interconnection portion including a first part 44 and a second part 42, the first part spanning between the metal surface and the semiconductor unit, the second part spanning between the metal surface and the electrode of the semiconductor unit, the second part being wrapped by the first part, the first part having a melting point lower than that of the second part and adhering to the second part (column 7, lines 4-7).

- Regarding claim 13, Jiang et al. disclose that the interconnection portion electrically connects the metal surface and the semiconductor unit (fig. 1).

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- Regarding claim 14, Jiang et al. disclose that the interconnection portion mechanically connects the device carrier and the semiconductor unit (fig. 1).
- Regarding claim 18, Jiang et al. disclose that the second part is sealed by the first part, the device carrier and the semiconductor unit (fig. 1).
- Regarding claim 19, Jiang et al. disclose that the first part contains materials by which the solder wettability between the first part and the second part is controlled by the second part (fig. 1, column 8, lines 53-56 and column 11, lines 27-30).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang et al. (U.S. Pat. 6,610,591) in view of Desai et al. (U.S. Pat. 6,281,581).

Jiang et al. substantially disclose all the limitations as claimed above except for the first part contains more tin than lead, while the second part contains more lead than tin.

However, Desai et al. (fig.5A) disclose an interconnection portion including a first part 614 and 612 and a second part 610, wherein the first part contains more tin than lead, while the second part contains more lead than tin (fig. 5A, column 6, lines 1-5). Therefore, it would have been obvious to one having ordinary skill in the art at the time

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the invention was made to modify the device structure of Jiang et al. by replacing the first part contains more tin than lead, while the second part contains more lead than tin, as taught by Desai et al., in order to increase the reliability of the connection between an area array package and supporting the substrate (column 3, lines 15-18).

5. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang et al. (U.S. Pat. 6,610,591) in view of AAPA (figs. 1a).

Jiang et al. substantially disclose all the limitations as claimed above except for the device carrier is a lead frame.

However, AAPA (fig. 1a) discloses a device carrier is a lead frame 101 enclosed by the metal surface 82. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the device carrier of Jiang et al. by a lead frame, as taught by AAPA, such lead frame is well known in the art for reducing the package size and small chip design.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang et al. (U.S. Pat. 6,610,591) in view of Grigg (U.S. Pat. 6,506,671).

Jiang et al. substantially disclose all the limitations as claimed above. Jiang et al. also disclose the first part has an end contacting the electrode of the semiconductor unit. Jiang et al. fail to disclose the first part partially contacts an area which is part of the semiconductor unit and which surround the electrode of the semiconductor unit.

However, Grigg (cover fig., column 6, lines 19-25) discloses an interconnection portion including a first part 50' and second part 20', wherein the first part has an end partially contacting an electrode 12 of a semiconductor unit 10 and partially contacting

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an area which is part of the semiconductor unit and which surrounds the electrode of the semiconductor unit. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device structure of Jiang et al. by having the first part partially contacts an area which is part of the semiconductor unit, as taught by Gigg, such the contact area would prevent contamination of the passivation layer surrounding the contact pads and reduce the occurrence of solder fatigue (cover fig., column 4, lines 10-20).

Response to Arguments

Applicant's arguments with respect to claims 12-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DLN



HOAI PHAM
PRIMARY EXAMINER